FIG. 1.—KUL'AT SIMÂN. OCTAGONAL COURT.

THE ARCHITECTURE OF CENTRAL SYRIA.

TWENTY-THREE years ago the Comte de Vogüé published a work on the Architecture of "Syrie Centrale," a subject to which he had devoted twelve years of travel and research. His work, in two large quarto volumes, contained 151 engraved plates of great beauty in execution, and many woodcuts in the text, illustrating the civil and religious buildings of the Haouran, a large district lying south-east of Damascus, and of the northern portion of Central Syria, between Antioch and Aleppo, and extending about a hundred miles to the south thereof. The period covered by the execution of these buildings ranged from the first to the seventh century, and included: first, those carried out under the Roman rule; and afterwards, those in which a hitherto unknown style had been developed by the early Sabæan Christians. The researches of early travellers, such as Burckhardt, the Rev. J. L. Porter, Cyril Graham, and others, had revealed the existence of remains of the Roman period beyond those which had been made known to us by Dawkins and Wood, and by Cassas at Palmyra and Baalbek. But the magnificent series of early Christian works, and the complete development of a style in which the Byzantine and what might be regarded as a Romanesque type (viz. a style founded directly on Roman architecture) were blended together, came to us as a revelation, and led some architectural writers to the conclusion that again to the East we should have to return if we desired to trace the origin of the Romanesque style of Europe. Against this theory, however, three strong arguments were put forward by M. de Vogüé: first, that this style was developed and completed at much too early a period, viz. between the fourth and seventh centuries; secondly, that the towns in question were deserted at the time of the Mahommedan invasions, and, except by wandering hordes of a nomadic people who had

sought temporary shelter in them, had never been since regularly occupied, and their destruction was due more to earthquakes than to the hand of man; and thirdly, that the Crusaders never reached these towns, which were situated too far from the seaboard whence they obtained their means of transport and protection. The Crusaders at the time (1098) took possession of Antioch, but in their descent to Jerusalem they followed the coast, and the Georgians only are instanced as having penetrated to and occupied the buildings of Kul'at Simân.

It is possible that within the last twenty years other travellers may have visited some of these deserted cities, but so far as we know no photographs or works have been published to illustrate or further elucidate the principles which guided these early Christians in the style they developed.

The reproductions which illustrate this article are made from photographs taken by M. Thevenet, of Antioch, and have been kindly lent by Professor van Berchem, of Geneva, who

FIG. 2.—KUL'AT SIMÂN. OCTAGONAL CHURCH.

has also taken others himself, which we hope to be permitted to reproduce later on. The value of the photographs is twofold. In the first place they substantiate the accuracy of the greater number of M. de Vogüé's plates, but in the second they suggest some slight inaccuracies which have crept in from the fact that the engraver has either introduced more decorative or constructive features than the building represented actually contained, or has misunderstood the peculiar construction of the buildings, representing them rather as we should execute them at the present day in Europe than as they were carried out in Syria in the sixth and seventh centuries. As examples of the former we might instance the drawing of Kul'at Simân [fig. 1], of which we give a portion of the central court of the great church represented in plate 144, and in fig. 2 the octagonal church illustrated in plate 150. Of the latter, in fig. 3, the window and door jambs of the upper story are decorated with mouldings which, though found in other buildings, do not exist in the house at Serdjilla, shown in

plate 33, and projecting corbels are shown on either side of the lower colonnade, which, though found in other examples, are non-existent in the Serdjilla house.

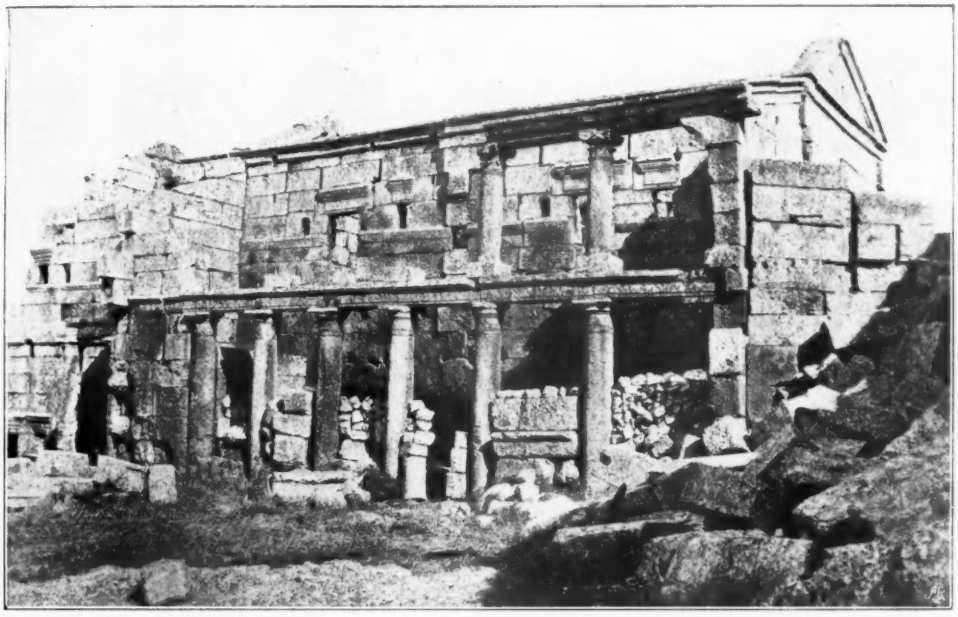

FIG. 3.—HOUSE AT SERDJILLA.

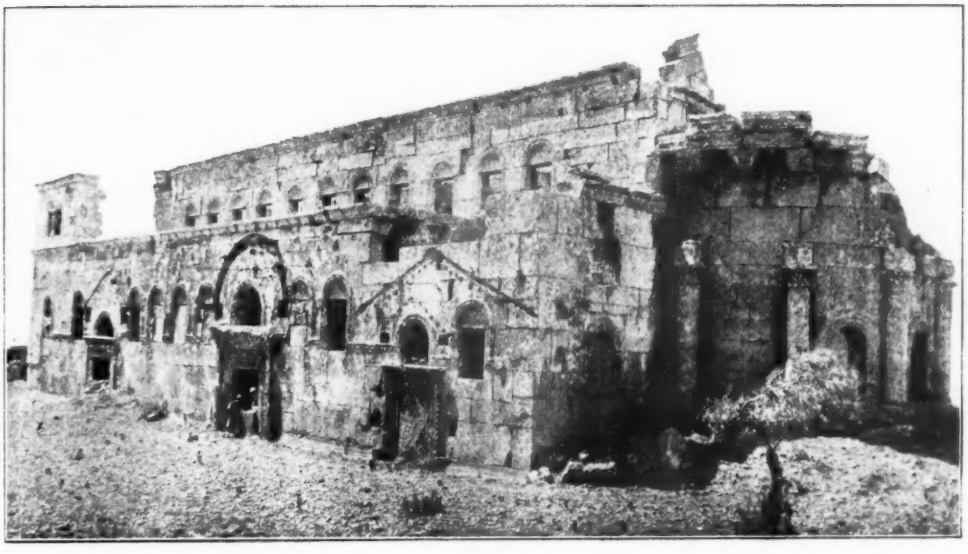

FIG. 4.—KALB LOUZY.

Again, in fig. 4 the masonry of the upper part of the apse of Kalb Louzy is in two courses only, whereas four are shown in plate 125. These, however, are slight inaccuracies not of very much importance; but fig. 5 shows a much more serious error made in plate 126, because the artist has unwittingly drawn in the arches of the nave with a nearly circular extrados, whereas in the reproduction of the photograph it will be seen that it is extremely irregular in its construction. Insufficient projection also is given to the upper corbels carrying the tie-beams of the roof, and the bold projections of the impost mouldings are quite lost sight of in the feeble contour as shown in plate 126. The carved keystones also are omitted in the plate. The irregular construction of the extrados of

FIG. 5.—KALB LOUZY

the voussoirs of the arches is one of those features found in Syrian masonry which seem to be peculiar not only in the Christian but in the Roman work. Renan attributes this faulty construction to the traditions of the Phœnician mason, whose architecture was essentially monolithic. When the Phœnician was unable to cut his dwelling or temple out of the solid rock he built with megalithic blocks, and subsequently carved out features belonging to other styles without any due sense of their meaning. Thus it is not infrequent to find capitals and portions of shafts cut out of the same block, and the same with bases. In the construction of arches voussoirs of immense depth were employed, with the extrados fitting haphazard with the horizontal courses above, and then to emphasise and give a decorative value to his arch the Phœnician architect carved his archivolt mouldings on the lower portion only, losing therefore that which in the regular arch is its chief constructive value, viz. its elasticity. In the immense doorways to their temples, the width of which was too great to allow of their being spanned by a single stone, the Roman architects employed voussoirs and built a straight arch; as, however, the architrave was not high enough to give the required depth to the voussoirs,

they were carried through the frieze as well; and the Christian architects, therefore, may have conceived the idea that architrave mouldings and friezes were purely decorative features, with no constructive meaning, and therefore dealt with their arches in the same way. It is remarkable that with such a lack of the elementary rules of construction, they should have produced such fine works as those which are illustrated in M. de Vogüé's *Syrie Centrale*, and that these buildings should have withstood so well the ravages of time and the shocks of occasional earthquakes. Unfortunately now another destructive element is creeping in; some of the deserted towns are being reoccupied, and within the last few years the famous Prætorium of Mousmieh (160–169 A.D.), illustrated on plate 7 and described on p. 45 in M. de Vogüé's work, has been pulled down to make way for a more modern erection. Of the famous church at Tourmanin (plates 130–136), the finest and most remarkable of the Christian churches in Syria, the triple apse only remains, and already, since M. de Vogüé's visit, many parts of the church at Kul'at Simân have given way, and its magnificent south porch, to judge by its condition as shown in photographs, can scarcely hold together much longer.

R. Phenè Spiers, F.S.A.

ARCHITECTURE OF THE FIFTEENTH CENTURY AND THE EARLY TUDOR PERIOD.

By Charles M. Hadfield [*A.*].

Read before the Sheffield Society of Architects, 13th March 1900.

IT was in the midst of that period of universal upheaval and change, the sixteenth century, that the great epoch of English national architecture, which had flourished and developed for some 400 years, came to a close—thrust aside, as it were, by the invading spirit of the Renaissance, or, as some critics would say, by a natural process of decay which follows on all completed development. Diverted, at all events, at that date into a current whose force was then irresistible, it has continued its flow in the new channel down to our own day; and although, during the century now approaching completion, we have removed the reproach which previously attached to us of ignorance and indifference as to our own national traditions, all the circumstances of to-day go to prove the fact that it is this spirit of the Renaissance by which we are still mainly dominated. This is proved by the architectural literature of the last few years as well as by the evidence of the most important modern buildings; and one cannot avoid the reflection that whilst we still profess, as an ideal, the attainment of a national and progressive style of building, we ignore more and more, as time advances, the essential means to such an end, to wit, an unwavering fidelity to the traditions of our native work.

When, almost a hundred years ago, interest in the study of English architecture began to revive, the work of the culminating or fifteenth-century period was the first to receive attention, and not unnaturally. Long after the Renaissance had taken root the old traditions lingered on, and it might be said that in certain directions, and in remote places, they were never entirely eradicated. The great issue of this first phase of the movement was, of course, the erection of the Houses of Parliament, a building which, conceived as it was when knowledge of the style was in its infancy, still ranks as perhaps the most distinctive of our national works of the nineteenth century.

As the so-called Gothic revival unfolded itself, and became enslaved by false and pedantic ideas, an unfortunate attitude was adopted towards the work of this period, and now that the movement has paid the penalty of its errors and extravagance we find dispassionate students and critics ready once more to recognise the facts of our architectural history in their true proportion and value. Two extracts will serve to illustrate my meaning more clearly. The first is from the *History of Henry VII.'s Chapel at Westminster*, by Lewis N. Cottingham, published in 1829. He says: "I come now to the third class of pointed architecture. The development of this style, like the two preceding, was gradual, but had sufficiently established itself in the reign of Richard II.

to form a distinct class which, with the usual modifications ever attendant on the wants and luxuries of civilised society, continued until its unjust and extraordinary extermination in the reign of Henry VIII. This style has, by some fastidious critics, been considered as a debasement when compared with the earlier works; but let us consider the causes of the alteration, and we shall then, perhaps, have more reason to admire than to condemn."

The second quotation is from a lecture delivered in 1898 at the Glasgow School of Art by the late Mr. W. J. Anderson. The title of the lecture was "The Complete Gothic Style," and the view taken was that the work of the Perpendicular Period (1377–1547) was the distinctively English interpretation of the Gothic style, and that instead of being the decadence it contained within itself the culmination of the English style. In St. George's, Windsor, and King's College, Cambridge, the Gothic ideal was for the first time expressed in distinctively English terms, and up to this consummation all previous steps had been leading. That English architecture was a development, ruled and directed by the gradual growth of skill and knowledge and by social advancement, and not a "style" in the stereotyped sense which has made that word one of such hateful import since the Renaissance first brought the idea into existence, is a fact which the study of its latest phase makes very plain. Nothing brings it home to the student more clearly than the great skill and success with which at every stage of its progress new work was intermingled with or, so to speak, welded on to that of preceding periods, old plans and proportions being preserved or modified, in order to bring them into harmony with improved ideas and requirements.

In this connection the names of Gloucester and Winchester Cathedrals will at once occur to you, the former claiming chronological precedence, and being indeed sometimes put forward as the actual building in which so-called "Perpendicular" architecture was originated. The plan, as we see it at the present day, gives us practically the whole outline of the great Norman church built by Albert Serlo, the first Norman abbot, and completed in 1100, and I think it shows clearly the meaning of Professor Willis when he states that "the building is in conception a Norman building from bottom to top." How this Norman church was converted, on the existing plan, between 1337 (when Abbot Wygemore altered, recased, and vaulted the south transept) and 1500—just before which date the Lady chapel was completed by Abbot Farley—into the form in which we know it to-day pictorial illustrations will show, but neither these nor verbal description can possibly give an adequate idea of the constructive ingenuity and boldness of planning which a careful study of the work itself will reveal. The beginning of the prosperity of the abbey, as it then was, dates from the interment of King Edward II. within its walls, and the consequent importance it acquired as a place of pilgrimage. The monument of this unfortunate king, erected in 1334, gave the impetus to the work of reconstruction which commenced immediately afterwards, and in the very earliest of which we see perpendicular forms taking definite shape. The recasing and vaulting of the choir and presbytery were carried out under Abbots Staunton and Horton, between 1337 and 1377, during which period the north transept was completed, and the celebrated cloisters were also built as far as the chapter-house, their completion being effected under Abbot Froucester between 1381 and 1412. Of this work in the choir the description given by Mr. F. S. Waller in *The Builder* as "a really magnificent design" is not undeserved. The cloisters of Gloucester are so familiar through the fascination they have exercised over architectural draughtsmen that it is needless to solicit admiration for them. Attention, however, may be drawn to the early date of the work, a fact which has led Professor Willis to suggest that it was here that fan vaulting was first produced.

New College, Oxford, is an important link in our history, serving to remind us on what enduring foundations those men rest their fame who provide for the future growth and cultivation of knowledge. Mr. T. G. Jackson tells us "that New College has served as the model which all succeeding colleges at Oxford copied more or less closely" . . . and that "till the magnificent foundation of Wykeham there was no example of a college built on a consistent plan and completely furnished with chapel, hall, lodgings, kitchen, cloisters, and cemetery, all grouped round a central quadrangle and conforming to one consistent architectural design." The founder's original work remains in the chapel and hall, the cloisters, bell tower, the entrance and great front quadrangle. The chapel is a design of exceptional grandeur. Its noble proportions give it a precedence amongst its fellows, even in Oxford, and as it was the first type so it may be said to be an unsurpassed one of a collegiate chapel, if we except only its great successor—that of King's College, Cambridge. The plan is in the shape of the letter T, and consists of two oblongs, the chapel proper, having a length of some 120 feet to the arcaded screen carrying the organ loft, by a width of 30 feet, and the ante-chapel, about 72 feet by the same width. The latter is planned in three compartments, divided by lofty triple arcades, the central one carrying forward the width of the chapel itself, and the two side ones or aisles being each 18 feet wide. These simple proportions are well worth noting in view of the great effect of scale obtained. The reredos, which has of late years

had its niches once more filled with statues, is, like its smaller companion in All Souls' Chapel, a valuable example of the treatment accorded to the chief decorative feature of a church interior, the grandest remaining example of this being the great reredos of Winchester.

The last and greatest undertaking of Wykeham's life, the reconstruction of the nave of Winchester Cathedral, is a work which, from its historical and monumental importance, must be placed in the forefront of any account of English architecture. To the general observer, and perhaps also to the student of architecture, the first impressions of Winchester may not be those of unbounded enthusiasm. The stranger from the north, setting forth unaccompanied, and probably having to seek direction on his way, when he first stands within the close and looks down towards the building from the long avenue leading obliquely up to the west front, will be at some loss to realise that he has before his eyes the "largest mediæval church erected in England with the exception of old St. Paul's, London, and the largest cathedral of Northern Europe." The reconstruction of the Norman nave of Bishop Walkelin (A.D. 1093) was taken in hand by William of Wykeham's predecessor, Bishop Edington, under whose auspices were carried out the west front (a piece of work which has been the theme of much disparaging criticism) and the two adjoining bays of the nave on the north side and one on the south side. This was carried out between 1346 and 1360, and shows us the earliest phase of the style. But to speak of general effect: the most critical and well-balanced judgments are at one with those of its enthusiastic admirers in praise of the nave of Winchester as the most stately and magnificent church interior of which England can boast. So happily are its proportions adapted to each other that the preponderating length appears even greater than it is, whilst width and height are in almost perfect harmony, the former subordinated to the sense of loftiness, yet never tending, even when furthest from the eye, towards narrowness. Both width and height are brought to their proper keynote of value by the splendid vault of close on 400 feet, its full length being seen at once, fading away in a long-drawn-out and unbroken perspective beyond the comparatively low choir screen, and growing up from the nave columns with a rare sweep and gracefulness of outline, a combination such as few buildings in the world can rival. To linger inside on a summer evening and watch the sunlight from the great west window gradually fading out, and the twilight shadows spreading over towards the middle distance, is a sight calculated to stir the imagination, and to make one realise what a great thing architecture can be and once was.

I have dwelt on these great representative examples which illustrate, as it were, the budding and unfolding into leaf of the completed phase of English architecture. In point of date we are still standing on the threshold of the fifteenth century, and for another hundred years or more the tree continued to flourish in all its branches with a vigour scarcely diminished to the last, and to put forth a great body of work which, whatever modern critics may say, was distinctively English, and solved all the essential requirements of the architecture of a civilised and cultured state of society. In dealing with such a period I cannot, within present limits, attempt to describe in detail all even of its most noted achievements, but I must confine myself to a passing notice of a certain number of representative works, works such as, by universal acclaim, belong to the first rank of works of art. Taking ecclesiastical buildings first, let us begin with a classic example, viz. the chapel of King's College, Cambridge.

This building is not only one of the great masterpieces of its own style, but it has come to rank among the world's most celebrated buildings, one of those works whose celebrity is quite independent of the details and attributes of style, and rests on its sheer grandeur of conception and proportion. Its execution extended over a great part of our period, for it was commenced by King Henry VI. in 1461. The main fabric was not finished till 1513, another twenty years elapsing before the interior was entirely finished. Any allusion to King's College Chapel would be incomplete without some mention of its magnificent original painted windows, executed between 1516 and 1535. One hears much nowadays about the value of colour in architecture, and the coldness to which our mediæval interiors are reduced by the absence of it, but even the finest painted decoration will seem a poor thing to anyone after he has seen King's College Chapel, with the sun streaming through its windows and bathing the long vista of moulded vaulting piers, behind which the windows themselves lie hidden in perspective, in a flood of living, sparkling colour. The cultivation of colour did not suffer much neglect at the hands of designers who knew the secrets of such effects as these.

Taking East Anglian work, the great tower of Boston Church naturally claims attention. It belongs to the early part of the fifteenth century, and is said to have been influenced by some of the great Flemish campanili of the period, such as those of Malines or Antwerp. If the latter inspired it, probably few will be found to deny that the model was improved upon. The Church of St. Peter Mancroft, Norwich, is a remarkably fine and complete example of a perpendicular church. It belongs to the first half of the fifteenth century. Its total length is 212 feet. The treatment of the clerestory is very effective and a good instance of a feature which developed into one of

great importance at this date. The open roof over the nave, with its happy idea of a groined cove framing the clerestory and gracefully carrying down the lines of the principals on to the vaulting shafts, will be familiar to students from the drawing in Rickman's *Gothic Architecture*.

Passing now to an opposite part of the country, with an individuality of its own quite as strong and distinctive as that of East Anglia, viz. the county of Somersetshire, we may select as examples the two churches of St. Cuthbert, Wells, and St. Mary Magdalene, Taunton. A finer design of its kind than the tower of the first-named church would certainly be hard to find, and it is an illustration of the truth one constantly learns from studying these late English buildings that the elements of successful and striking design are to be found in simple arrangements of outline and telling proportion, rather than in excessive complication of detail or subdivision of parts.

Two churches may fitly represent the work of the Midlands. The first, that of St. John the Baptist, Cirencester, introduces quite another type of design—the elaborate and unusual arrangement of the south porch, which really forms the lower story of what, I believe, still serves as the Town Hall buildings. The other is the spire of St. Michael's Church, Coventry, erected between 1373 and 1395, more fortunate than its greater neighbour in remaining untouched (though probably not for very long) by modern restorers.

To form an idea of the high state of craftsmanship at this period nothing is more useful than to study the tombs and monuments of eminent persons with which its great churches abound. Here we shall often find examples of the most elaborate workmanship in marble or alabaster used in conjunction with metal work wrought and cast, enamelling, or painted decoration. The use of heraldry gave full scope for ornamental enrichment, and being a language expressed in decorative terms, it solved a problem over which we stumble sorely nowadays, viz. how to find a *raison d'être* for architectural ornament, providing the building in which it appears with decoration having a purpose and meaning. The tomb of Richard, Earl of Warwick, in the Beauchamp Chapel at Warwick, is probably as complete an example of English Mediæval craftsmanship as we could desire. Blore's *Monumental Remains* contains a copy of the original agreement between the Earl's executors and the different craftsmen by whom this important work was carried out. The document is interesting on account of a description of the methods followed in the execution of the art work of the time. The design is that of an altar tomb of grey marble, supported at the corners by moulded brass poles with the arms of Beauchamp and of France, England and St. George engraved on the extremities. The tomb is surmounted by a hearse of brass hoops gilded, covering the effigy of the Earl, which is cast in fine latten, a species of brass metal, richly gilded, and reposing on a table of brass also gilt. The workmanship displayed in this figure has been highly and deservedly extolled, and it may certainly be said that no finer piece of art craftsmanship exists in England. The canopies contain figures, also in latten, of relatives of the deceased, technically "weepers," and in the quatrefoils beneath are shields with armorial bearings enamelled on brass. In the smaller alternate canopies are similar figures of angels holding engraved scrolls.

I conclude my review with a cursory glance at the civil and domestic architecture. It is now that domestic architecture, as we understand the term, really commences. The gradual disappearance of the fortified type of dwelling, and the development in its place of the manor house, the frequent use in suitable districts of brickwork, and, later in the style, of terra-cotta, with the ready appreciation shown of their special characteristics and possibilities, all serve to show how readily the growing demands of social advancement were met. In truth, the sound principles on which the practice of constructive art then rested ensured success in grappling with every problem which presented itself. It is only by a return to these principles that architecture can be made to live again.

In considering this part of the subject one naturally turns to our great universities for illustrations, and especially to the city of Oxford, whose fortune it is, in these latter days, to exhibit to the world an example of a town made by English architecture. It has already occupied a share of our attention in tracing the career of William of Wykeham and his work at New College. To one of his scholars and second successor in the see of Winchester, William of Wayneflete, we owe that most delightful of all its colleges—Magdalen—famous for its picturesque situation, the diversity of grouping, the richness of detail which its buildings present, and, above all, for its celebrated tower. This is a later work than that of the founder, having been commenced in 1492 and finished in 1507, its erection being vaguely connected with Cardinal Wolsey, who was bursar of the college at the time, so that we see in it a work belonging quite to the last days of the style of which it ranks as a masterpiece. There are few spots where one realises better than round about Magdalen an ideal of the union of an English landscape with architecture. The founder's work is well represented in the Founder's Tower and Cloisters. Before leaving Oxford I may mention the Divinity School (built between 1445 and

1454, and completed in 1489), which forms the lower story of Duke Humphrey of Gloucester's Library afterwards enlarged and now known as the Bodleian.

I may remark on the fact that one of the traditions which even the confusion of modern ideas has not been able wholly to obscure is that of the type of an English public hall or interior, such as was developed during this period. The influence of those fine apartments, such as the old halls of colleges or inns of court, halls like that of Hampton Court and many another, seems still to assert itself in the design of similar things to-day, despite the prevailing eclecticism. St. Mary's Hall, Coventry, the hall of the Ancient City Guilds of Coventry, erected between 1394 and 1414, is a good example. It is an oblong apartment about 75 feet × 33 feet, with a raised platform 18 feet deep across the north end and a wooden gallery across the opposite one. It has a remarkably fine carved and panelled oak roof, and the fenestration is very dignified.

Cambridge has scarcely been so fortunate as its sister university in preserving for us the original character of its collegiate buildings. Bishop Alcock's college, "Jesus," retains much of the old charm, and in the gateway of St. John's we have a stately and interesting design in brick and stone work, and one which illustrates the use of heraldic decoration to which I have already alluded. It was built about 1510, and the sculpture represents the arms, with supporters and badges, of the foundress, Lady Margaret Beaufort, mother of Henry VII.

The largest and most important example of English domestic work is, undoubtedly, Henry VIII.'s and Cardinal Wolsey's palace at Hampton Court. In these extensive buildings we possess a field for the study of secular architecture as fertile in suggestion as Winchester affords us for ecclesiastical work. In our own neighbourhood (Sheffield) we possess, in Wingfield Manor and Haddon Hall, two notable buildings, the latter one of world-wide renown, in which English domestic architecture may be thoroughly studied and understood.

It would be presumptuous in me to attempt to appraise the general results of the Renaissance movement of the sixteenth century, or to give an opinion on its achievements in the sphere of literature, painting, and other arts, but I do think that so far as English architecture is concerned its advent marked the end of all true progress, and the history of the last three hundred years, despite the compensating records of individual genius, is the history of a reaction. Without national traditions no art, and architecture least of all, can hope to flourish in the true sense of the word, or to produce work of permanent value, and the fact that our continuity of tradition was destroyed by the Renaissance is too vital to be explained away or to be glossed over. If we had kept this national ideal constantly in view, instead of turning aside from it, just when the seeds of knowledge cultivated during the middle years of this century were ripening with the promise of a good harvest, we might perhaps, even now, have been once again ministering to a progressive architecture, and carrying it forward beyond the point at which our sixteenth-century predecessors laid it down when the deluge came upon them. However, this is an unfulfilled hope, and I am afraid we must trace its disappointment to the eagerness with which erroneous ideas as to what constitutes real originality in design have been pursued during recent years. Fortunately we have the remedy in our own hands, and there is no need to be pessimistic about the future. It only rests with those who have made the production of building their work in life, to apply the knowledge gathered, during the past century, in the light of the principles it embodies, remembering always that they are English architects with a great past, and endeavouring, as far as may be possible, to resume the broken continuity with those days when their craft worthily represented the progress and commemorated the history of the English race.

THE SUPPORTING POWER OF ROCKS AND SOILS.

EXPERIMENTS AT CALCUTTA.

By Hugh Leonard [*H.A.*], *Science Standing Committee.*

On commencing several new buildings in Calcutta in the year 1873 it was considered desirable to test the actual weight Calcutta earth would bear without allowing buildings to sink, as great sinking had occurred in many of the existing structures. A piece of ground was selected fairly representing the average sites of Calcutta buildings, and on this site experiments were made by building blocks of masonry as ordinarily used in work, laying the foundations at various depths, and then loading the blocks with railway rails, and testing the sinking from a fixed point daily. The tables appended show the results.

The formation of the delta ground in and about Calcutta, and where the tests were carried out, is as follows:—Surface, and for 2 feet in depth, rich soil; for the next 4 feet, fairly compact bluish clay, quite dry; next 4 feet brownish clay of some consistency, also quite dry; then brownish clay, but mixed with sand and not so dry, for 8 feet; then a layer of impure peat, about 2 feet, fairly dry; then sand and clay, very wet.

The result of the tests showed that, for Calcutta, the weight on the foundations should not be more than 1 ton to the superficial foot, consequently the foundations of all future buildings were spread so as to put not more than this weight on the earth. Since this has been done no sinking or cracking of new buildings has occurred.

Experiments made at Akra for the purpose of testing what weight the ordinary undisturbed alluvial soil of Calcutta, which fairly represents Lower Bengal Delta soil, can bear.

Number of experiments	Depth below surface of ground	Size of Pier constructed	Total height of Pier	Materials	Total contents of Pier	Weight of Pier at 100 lbs. per c. ft.	Superficial area of Pier	Age of Pier	Load, excluding weight of Pier	Weight per sq. ft., *including weight of Pier*	Result of Loading		Remarks
											Days	Sinking	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1[1]	Ft. In. 1 4	Ft. In. 3 square	Ft. In. 2 11¼	Bricks with mortar, two of soorkee[2] to one of lime	C. ft. 30·88	Tons cwt. qr. lbs. 2 3 0 8	S. ft. 10·29	6 days	Tons cwt. qr. lbs. 41 0 0 0	Tons cwt. qr. lbs. 4 3 3 13·8	1st 2nd 3rd	⅞ 3⅝	The pier sank 3⅝ inches with this load by compressing the ground on which it stood; the surrounding ground was not visibly disturbed, except for a distance of about 2 or 3 inches immediately in contact with the pier, which seemed to be caused by friction on two sides, the load being slightly in excess on those sides
2[3]	2 6	3 2½	5 0½	Ditto . . .	51·89	2 6 1 9·4	10·29	—	10 7 3 8	1 4 2 20·3	1st 2nd 3rd	3/16 1¼ 5/16	From this experiment it would appear that only the ground under the masonry sinks, the surrounding ground not being disturbed to any appreciable extent Immediately on lowering screw jacks[4]

3	2	6	3	2½	5	0½	Ditto . . .	51·89	2	6	1	9	10·29	—	20	14	2	19	2	4	3	5·6	1st	1	On lowering screw jacks
																							2nd	1¾	
																							3rd	1 13/16	
																							4th	1⅞	
																							5th	2	
																							6th	2⅛	
																							7th	2¼	
4	2	6	3	2½	5	0½	Ditto . . .	51·89	2	6	1	9	10·29	—	31	1	2	3	3	4	3	17·2	1st	5⅛	On lowering screw jacks
																							2nd	5⅜	
																							3rd	5⅝	
																							4th	5½	Very heavy rain fell on the night of the 4th
																							5th	6 5/16	The sinking of this block is considerably more than in experiments which were 4 feet and 8 respectively below the ground level; a good deal of rain fell during the time this experiment was in progress, and the soil to the depth of foundation was, no doubt, saturated
																							6th	7 5/16	
																							7th	7 7/16	
																							8th	Not measured	
																							9th	7 7/16	It shows fairly the danger of shallow foundations
5	4	0	2	9½	5	9	Ditto . . .	42·12	1	17	2	12	7·76	—	7	16	2	21	1	5	0	4·3	10th	7 11/16	Immediately on lowering the screw jacks. No further sinking took place with this weight for a space of seven days
																							1st	3/16	
6	4	0	2	9½	5	9	Ditto . . .	42·12	1	17	2	12	7·76	—	15	10	3	22	2	4	3	17·4	1st	0	
																							2nd	1/16	
																							3rd	1/16	
																							4th	1/16	
7	4	0	2	9½	5	9	Ditto . . .	42·12	1	17	2	12	7·76	—	23	5	0	24	3	4	3	5·2	1st	1¼	No further sinking took place
																							End of 1st	2⅝	On lowering screw jacks
																							3rd	3	
																							5th	3¼	No further sinking
																									The Executive Engineer states, "heavy rain fell during part of the time of the last loading, by which the ground was flooded, and most probably water percolated to the foundation. This, combined with very strong wind blowing from the south and east, caused the unequal settlement of the block"
8	8	0	3	2½	10	6½	Ditto . . .	108·50	4	16		14	10·29	—	10	6	0	20	1	9	1	22·5	1st	3/16	No sinking was observed from the 2nd to the 7th day

[1] The object of this experiment was to ascertain whether the ground under the masonry alone is compressed, or whether the compression extends for some distance round the foundation.

[2] "Soorkee" is red brick ground to dust.

[3] The object of this and the eleven following experiments is to show the compression of the soil at different depths, and under different weights.

[4] A frame carrying the load was supported by screw jacks at each corner during the work of loading so as not to disturb the masonry during the process of loading; when the desired load was on, the screw jacks were lowered, and the load was brought to bear on the masonry.

Experiments made at Akra for the purpose of testing the ordinary undisturbed alluvial soil of Calcutta—concluded.

Number of experiments	Depth below surface of ground	Size of Pier constructed	Total height of Pier	Materials	Total contents of Pier	Weight of Pier at 100 lbs. per c. ft.	Superficial area of Pier	Age of Pier	Load, excluding weight of Pier	Weight per sq. ft., *including weight of Pier*	Result of Loading		Remarks
											Days	Sinking	
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Ft. In.	Ft. In.	Ft. In.		C. ft.	Tons cwt. qr. lbs.	S. ft.		Tons cwt. qr lbs.	Tons cwt. qr. lbs.			
9	—	3 2½	10 6½	Bricks with mortar, two of soorkee to one of lime	108·50	4 16 3 14	10·29	—	20 13 0 3	2 9 2 5·9	1st	$\frac{9}{16}$	
											2nd	$\frac{9}{16}$	
											3rd	$\frac{8}{8}$	
											4th	$\frac{11}{16}$	
											5th	$\frac{11}{16}$	
											6th	$\frac{11}{16}$	
											7th	$\frac{11}{16}$	
10	—	3 2½	10 6½	Ditto . . .	108·50	4 16 3 14	10·29	—	30 19 3 14	3 9 2 17·4	1st	$1\frac{1}{8}$	The result of this experiment tends to show that the bearing power of soil at 8 feet depth is no better for light weight than at 4 feet, but for heavy weight it seems to bear more
												$1\frac{7}{8}$	
											3rd	$1\frac{11}{16}$	
											4th	$1\frac{11}{16}$	
											5th	$1\frac{5}{8}$	
											6th	$1\frac{5}{8}$	
											7th	$1\frac{5}{8}$	
											11th	$1\frac{5}{16}$	
11	11 0	3 2½	14 0½	Ditto . . .	144·53	6 9 0 5	10·29	—	10 7 3 27	1 12 3 6·8	1st	Nil	On lowering screw jacks
											End of 2nd	$\frac{3}{16}$	Extra load put on to make the weight equal to a ton to the foot, exclusive of brickwork
											3rd	$\frac{7}{16}$	
											4th	Sunday	
											5th	$\frac{13}{16}$	
											8th	$\frac{15}{16}$	
											9th	$\frac{15}{16}$	In this and the two following experiments the foundation carried more than in the preceding experiments. But even allowing for this, the ground seemed to be capable of bearing less at 11 feet than at 4 or 8 feet
											10th	1″	
											12th	1″	
											13th	$1\frac{1}{16}$	
12	11 0	3 2½	14 0½	Ama[3] bricks with mortar, two of soorkee to one of lime.	144·63	6 9 0 5	10·29	—	20 17 0 23	2 13 0 9·5	1st	$1\frac{1}{2}$″	On lowering screw jacks
											2nd	3″	
											3rd	3″	
											4th	3″	
											5th	Sunday	
											6th	$3\frac{1}{8}$	
											7th	$3\frac{3}{16}$	
											8th	$3\frac{3}{16}$	
											9th	$3\frac{7}{16}$	

13	11	0	3	2½	14	0½	Ditto	ditto	144·63	6	9	0	5	10·29	—	31	4	0	6	3	13	0	20·5	1st	3 3/4"	On lowering screw jacks
																								2nd	6 11/16	
																								3rd	Sunday	I think the greater sinking in the case of this pier may be explained in this way. At a depth of 11 feet, the ground, which gets soft, *rose* before the load was put on, and hence sunk more when again under heavy pressure
																								4th	6 7/8	
																								5th	6 15/16	
																								6th	6 15/16	
																								7th	7	
																								8th	7	
																								9th	7 1/16	
																								10th	Sunday	
																								11th	7 1/8	
																								12th	Not measured	
																								13th	7 1/8	
																								14th	7 3/16	
																								15th	7 3/16	
																								16th	7 1/4	
																								17th	Sunday	
																								18th	7 5/16	
14[6]	4	0	2	10	7	4½	Third class Akra bricks with mortar composed of two of soorkee to one of lime		59·20	2	12	3	12	8·03	15 days	8	0	0	0	1	6	2	0·7	1st	5/16	The pier, loaded with one ton per foot, was left standing for three months, but no further sinkage than what was recorded on the 14th day was discovered during the remainder of the time
																								7th	5/16	
																								14th	5/16	

[5] "Ama" means badly burnt bricks.
[6] The object of this experiment was to ascertain if, without adding weight, sinking occurred from long standing.

SUMMARY.

No.	Depth of Foundation below surface of the ground	Maximum Sinking with Weight per Square Foot of—			Remarks
		1 ton	2 tons	3 tons	
1	2	3	4	5	6
		Sinking			
1	2 feet 6 inches	Inch 5/16	Inch 2 1/8	Inch 7 7/8	
2	4 feet	3/16	1	3 1/16	Including the weight of brickwork
3	8 feet	3/16	11/16	1 13/16	
4	11 feet	1 1/16	3½	7½	Exclusive of ditto

ARCHITECTURAL EDUCATION IN THE UNITED STATES OF AMERICA.

By Arthur Cates [*F.*].

THE attention of the Institute has from time to time been invited to the great advance made in recent years throughout the United States, in the organisation and development of a complete systematic course of architectural education, in the forefront of which movement our esteemed and respected Honorary Corresponding Member, Professor William R. Ware, now of Columbia University, N.Y., has been the active and influential leader and organiser.

In the late "forties" and early "fifties" many smart young architects went from London to the States, and there speedily attained to good and influential positions, prospering greatly; but as London did not afford any opportunity for sound systematic artistic education, the young American student did not come here for the instruction which he sought, but a steady stream of earnest aspirants flowed to Paris, where, in the ateliers of distinguished architects, and in the Ecole des Beaux-Arts, they found the instruction and guidance they desired.

This special training of those who now occupy leading positions in the profession, and the developments which have followed the persistent teaching and exertions of Professor Ware, have so influenced the progress of education in the States that the student, if he has not already done so, may soon hope to find at home sources of instruction which will render the course in Paris less necessary, and even a comparatively superfluous luxury. It has even been suggested that at no distant period, the ambitious English student who may desire to prepare himself for the effective practice of Architecture, and go through a complete course of technical and artistic training, may find it expedient to resort to one of the American Universities, and there obtain that thorough education which sluggish indifference to educational advancement, and blind adherence to the antiquated and effete system of pupilage, does not afford him here.

The old system of apprenticeship, where one or two apprentices were practically instructed by a skilled master in the mysteries and details of a trade or profession, had undoubted advantages, bringing to bear on the youth the continuous personal and almost parental influence of a master by whose direct instruction he could learn to adapt and carry out intelligently the ideas resulting from many years of experience and study; but although there may be some cases in which a pupil of these days may enjoy similar advantages, the stress and struggle of modern life, the wide range of knowledge and acquirements now necessary to ensure success, and the changed relations between master and pupil, render a systematic course of strictly professional education most desirable as a prelude to entry on the active business of an office.

In too many cases the education of a young architect in this country is limited to what he may "pick up" in the office, of which the payment by his parents of a considerable premium has entitled him—a lad raw from school who has not yet learnt how to learn—to have "the run"; where, if capable and industrious, he will be taught so far as may be necessary to enable him to take part in the office work, and to waste that time which should have been occupied in the completion of his education, to the still further advantage of his master, by taking the place of a paid assistant; or he may, if so disposed, cultivate artistic and dilettante indolence, and render himself incapable of thereafter taking an active part in the work of life. In either case his future position would be very different from that which he might have attained had the time so spent in the office been appropriated to systematic education.

The recent receipt of the Annual Report for 1899 of the President and Treasurer of the Massachusetts Institute of Technology, of Boston, U.S.A., and the Kalendar quaintly described as "The Annual Catalogue 1899–1900," affords the opportunity for noting many interesting particulars concerning the course of instruction in Architecture followed at the Massachusetts Institute.

The Massachusetts Institute, commenced as a School of Industrial Science, was opened in 1865 with 15 students, but has attained to so remarkable a development that the official staff now numbers 131 professors and assistants as "officers of instruction," 7 instructors in manual work, 30 teachers and lecturers, and numerous occasional lecturers in special subjects. For the department of Architecture there is a special staff, of a professor of architecture, a professor of architectural design, two assistant professors, an instructor, a lady assistant, and a teacher and lecturer on design, the necessary instruction in other subjects, such as mechanical and freehand drawing, mathematics pure and applied, geometry,

perspective, stereotomy, languages (French and German), business law and relations, and the other items of the curriculum, being given by other members of the professorial staff.

This architectural course aims to prepare the students, not only for those years of work as subordinates, when accuracy, rapidity, and taste in drawing and design, with accurate knowledge of detail, will be most useful qualifications, but also for their subsequent independent career, when sound technical knowledge will be most important.

The full course extends over four years, the first being devoted to those preliminary studies which are essential to form a sound basis for the strictly professional course of the three succeeding years, in which the instruction comprises the study of construction and materials, of building processes and professional practice, of composition and design, and the history of Architecture. The course is arranged to meet the needs of those who are commencing their professional studies, as well as of experienced draughtsmen who desire to make up deficiencies in their training, or to qualify themselves for undertaking the responsibilities of practice. During the entire course there is regular instruction in freehand drawing, that of the last year being from life. For three years the students are continually engaged upon architectural design, each student's work being examined and criticised before the classes by a jury from the Boston Society of Architects. An option in architectural engineering is offered to students who intend to make a speciality of construction, and advanced courses in design, history, and construction are offered to graduates of the regular course.

In addition to the general library of the Institute for works of general reference, there are ten distinct libraries of special treatises, monographs, text books and periodical publications germane to the work of the respective departments, of which the architectural library contains nearly four thousand volumes of technical books and the leading American and foreign periodicals, a carefully selected collection of eleven thousand photographs, six thousand lantern slides, and a collection of casts of architectural sculpture and detail.

The studies are not limited to the University course: travelling students send measured drawings as "envois" from Rome, Florence, Bologna, &c., and a large number of graduates continue their studies abroad; a year of study and travel in Europe forming an excellent continuation of the regular course, especially when the studies are properly directed under scholarly supervision.

Study in the vacation is not overlooked: there is a Summer School of Architecture, which last year made a very profitable tour in Europe. Crossing the ocean to Genoa, the school visited Milan, Brescia, Verona, and Venice, and, making a bicycle tour from Genoa along the Riviera to Marseilles, visited Aix, Arles, Nîmes, Avignon, the Puy de Dôme, Vezelay, Sens, Troyes, and Paris—making measured drawings and sketches by the way, and taking over 700 negatives of important details and buildings.

These particulars of the development of systematic education apply in all general features, not only to the Massachusetts Institute, but to many other institutions throughout the States, of which it may suffice here to mention, the Harvard University, also in Massachusetts; the Columbia University, the Cornell University, the Syracuse University in New York City and State; also in Philadelphia the University of Pennsylvania, and in Chicago the University of Illinois, all with similar and not less efficient courses of instruction in Architecture.

At Harvard University, Cambridge, near Boston, Massachusetts, founded in 1638, the oldest and most distinguished of the teaching institutions of the United States, a department of architecture has within the last five years been established, and the high qualification required of students for admission to the University and the influence of the general environment have led to modifications of the scheme of study from those of the Massachusetts Institute, less time being given to general studies, and more to design and history; but the broad principles are similar, and the thorough systematic training of the students in the art and science of Architecture is the object aimed at.

As is the universal custom in relation to these institutions in the United States, liberal donations for buildings and endowment much facilitate the work. A recent gift of £40,000, by a benefactor whose name is not disclosed, will much advance the development of this new school, which has also the advantage of using the Fogg Art Museum, which contains a fine collection of casts and objects of art, over 26,000 photographs, 1,528 lantern slides, 28,000 prints and drawings, &c., illustrating the history of the fine arts.

The Austin Travelling Fellowship in Architecture, of the annual value of £200, is open to those who have taken with distinction the degree of Bachelor of Science in Architecture, this being the seventh endowment for travelling in Architecture which has been established in the United States.

The School of Architecture in the Columbia University is under the direction of Professor William R. Ware, whose successful exertions in the cause of architectural education and able addresses and writings are highly appreciated by those who are interested in the subject. In his remarkable Address of June, 1898, to the Architectural League of New York, he discusses the principles which should govern teaching in a school of architecture, and this deserves, no less than his other writings on the subject, careful

study. The teaching staff of the Architectural Department numbers nine professors and lecturers expressly appointed, while fourteen officers of other departments give instruction in special subjects connected with the department.

The students have not only the privilege of using the fine general library of the University of some 250,000 volumes, but also the splendid architectural library placed at their disposal by Mr. and Mrs. Avery,* a fine collection of photographs, prints, and drawings, all classified and arranged according to their subjects, and the Willard collection of architectural casts and models, probably the most carefully selected and best arranged, if not the largest, of any in the world.

Professor Ware warmly urges the cultivation of individuality in the students, so that, while strictly conforming to certain requirements, they shall at every stage of their work have a degree of latitude and freedom, always finding some necessary element to supply from their own taste and intelligence, thus tending to develop in every student whatever independence of character and spark of originality he may chance to possess.

Professor Ware further expresses his views in the following admirable sentences:—"To develop in the school a distinctive method in design by which the style of contemporaneous building shall be influenced and controlled, as the architecture of France seems to be influenced by the fashions which from time to time prevail in the Ecole des Beaux-Arts, is by no means our object. This would be, under the circumstances, an improper and most unbecoming ambition. It was, to be sure, suggested some years ago, in high quarters, that the schools in this country would do well to take up and solve the problem of developing a new architectural style, which should be thoroughly national and should express the characteristics of the twentieth-century civilisation in this country. But this cry finds no echo in our minds. It is for the architects themselves, practising in their offices, to create, as they may, the architecture of the future by erecting the most sensible and beautiful buildings they can. It is the business of the school to see to it, as far as we may, that the architects themselves have the good sense and good taste, and the self-reliance and independence of mind which shall qualify them for this task."

Much assistance to the study of design is given by the Society of "Beaux-Arts" Architects of New York, the object of which is to further the architectural interests of the country, the active members of the Society being limited to those who have been connected with the Ecole des Beaux-Arts in Paris. The Society issues programmes three times during the season, divided into two classes, one for younger students and one for those more advanced. These competitions are open to any architectural student: the drawings are exhibited in New York. Medals and certificates of merit are awarded. Several ateliers have been opened in New York in connection with the Society for the instruction of students, and from the various colleges and universities there are very satisfactory returns: thus the beneficial influence of the best features of Beaux-Arts training is brought to bear on the students, tempered by the practical considerations of active life.

The Cornell University, in the city of Ithaca, New York State, incorporated in 1865, and opened in 1868, has a four years' course of Architecture similar in its details to that above described. The Faculty of the College of Architecture is well manned, having eight professors and assistants, and four special lecturers. The travelling scholarship attached to this College is peculiar in providing for two periods of residence in Europe, with an intervening period of study in the College.

The Syracuse University, established in the central city of the Empire State, has in its College of Fine Arts a department of Architecture with a four years' course, as in the preceding institutions.

Besides the regular course in these colleges, a special two years' course in Architecture is arranged to meet the requirements of those draughtsmen of two or more years' experience who are desirous of pursuing a course in Architecture, but whose early education would not enable them to pass the entrance examinations in mathematics and other subjects, and who cannot take the time to pursue a four years' course.

As a typical institution outside of the Empire State, the University of Pennsylvania, established in Philadelphia, may be mentioned. The School of Architecture in that University is conducted on similar lines to those before described, by a four years' course intended to combine thorough professional training with the essentials of a liberal education. The officers of the Department of Architecture comprise eleven professors and instructors and two lecturers, by whose exertions the standard of efficiency of the schools, as practically evidenced by "The Year Book of the School of Architecture" annually published, is maintained at its highest point, the aim being to secure to its graduates the very best preparation for the demands of subsequent professional practice.

* The "Avery Memorial Library" was founded in 1890 by Mr. Samuel P. Avery, and Mrs. May O. Avery, his wife, as a memorial to their son, Henry Ogden Avery, an architect of great promise, who was born in 1852 and died in 1890, the foundation of it being the fine library he had collected, extended in the most liberal manner by the generosity of his parents. The catalogue, a copy of which has been presented to the Institute Library, is itself a commendable and useful work in a sumptuous volume of no less than 1,139 pp. folio. In the JOURNAL, 3rd Series, Vol. III. (1896), pp. 188–90, appeared an interesting sketch of the Avery Library, its objects and scope, from the pen of Mr. Barr Ferree [*H.C.M.*], of New York.

In the professional work of the course the major portion of the student's time is devoted to the study of the general subject of design ; courses in architectural history support this line of study and broaden the general view of the student; and adequate attention is given to those subjects which may be comprehended under the term "architectural engineering." Skill and taste in draughtsmanship are acquired by the student under constant exercises continued throughout the course, not only in drawing incident to the study of design, but in the various phases of instruction in pure drawing.

This portion of the course consumes about three-fourths of the time required of the student, the remaining portion being devoted to strictly academic studies, including English and English literature, French or German, mathematics, physics and chemistry, all of which are taken in the first two years of the course. In this college there is also a special course of two years offered to architectural draughtsmen who desire to supplement office experience with technical training in design and other subjects.

As an adjunct to the course in Architecture a three years' special course in interior decoration is offered, with the object not only of fitting its students for the intelligent designing of all those objects of industrial art that pertain to, and are included in, an artistic interior; but also of imparting a knowledge of those underlying principles that form the foundation of a sound taste in that branch of æsthetics included under the name of decorative art.

This systematic training and completion of education in academic studies in these University courses cannot, however, be allowed to supersede the necessary final stage of experience in an architect's office; but it effectively prepares for it, enables the student to rapidly appreciate and assimilate such experience, and to supplement it in a most important manner.

With all the advantages now accessible to the student in this country, there is not any systematic and thorough course available for him in any way approaching in completeness to those afforded by the American Universities: in too many cases the pupil desirous of advancing his knowledge can only do so by taking up courses of evening instruction, after his daily work of office routine has exhausted him physically and mentally, and rendered him unfit to reap the full benefit of his studies. The energy of the late Professor Banister Fletcher and the generosity of the Carpenters' Company have much improved the course of study available at King's College and University College. The School of Architecture at University College, Liverpool, under Professor Simpson, is another great step in advance, and Glasgow has progressed in the right direction, in its Technical College under Professor Gourlay, and the School of Art connected therewith; the Municipal Technical Schools and Schools of Art throughout the country aid in the spread of knowledge, which in time will give rise to a demand for the more systematic course of instruction herein advocated.

The establishment of the Teaching University for London and of the Birmingham University raised hopes that Architecture might take its place as a recognised Faculty, and the now scattered and unorganised sources of teaching be consolidated under the influence of a systematic course, which, except for the final instruction in the experience of office work, in all cases where complete education was desired, would have superseded the present defective system of pupilage. These hopes, alas! have not been realised.

The Institute, by its position and influence, can do much towards attaining this end: it has already, with the help of the Architectural Association, effected great improvements in the education of the architect, and, with the success of the American schools as encouragements, may well endeavour to secure for the coming race of students a systematic course of professional University education not inferior to those herein described. The task, if undertaken, is one of great difficulty, and in any case can only be advanced slowly; but, notwithstanding the discouragement of London and Birmingham, every advance in improving the means of education will be a step onwards towards this end.

9, Conduit Street, London, W., 16*th June* 1900.

CHRONICLE.

THE ANNUAL ELECTIONS:

SCRUTINEERS' REPORTS.

The Council.

The Scrutineers, Messrs. R. A. Briggs [*F.*], Frederick E. Eales [*F.*], H. Hoyne Fox [*F.*], and Albert W. Cleaver [*A.*], report that they examined 503 voting-papers for the election of the Council 1900-1, and that two of the papers were rejected for informality. The following are declared to be the results:—

President. William Emerson [*unopposed*].

Vice-Presidents (4).—John Belcher; John McKean Brydon; Edward Augustus Gruning; John Slater [*unopposed*].

Hon. Secretary. Alexander Graham [*unopposed*].

Members of Council (18).—*Elected*: Aston Webb, 423 votes; George Frederick Bodley, 401; Henry Thomas Hare, 360; John Alfred Gotch, 348; Edward William Mountford, 346; Thomas Edward Collcutt, 345; William Douglas Caröe, 331; William Milner Fawcett, 327; Leonard Stokes, 324; Thomas Blashill, 322; Richard Phenè Spiers, 321; Beresford Pite, 307; George Halford Fellowes Prynne, 300; Paul Waterhouse, 299; James Brooks, 294; Frank Thomas Baggallay, 287; Henry Heathcote Statham, 286; Edwin Thomas Hall, 275.—*Not elected*: Percival Gordon Smith, 244 votes; William Young, 233; Benjamin Ingelow, 214; Thomas Jerram Bailey, 195; Ralph Selden Wornum, 191; John James Burnet, 185; Thomas William Aldwinckle, 178; Thomas William Cutler, 162; Sidney Robert James Smith, 122.

Associate-Members of Council (2).—*Elected*: Henry Vaughan Lanchester, 223 votes; Robert Shekleton Balfour, 218.—*Not elected*: Arthur Smyth Flower, 203 votes; James Sivewright Gibson, 201.

Representatives of Allied Societies (9).—*Elected*: Sir Thomas Drew, 385 votes (Royal Institute of Ireland); Francis Haslam Oldham, 372 (Manchester Society); David Barclay, 320 (Glasgow Institute); Frank William Wills, 319 (Bristol Society); William Carby Hall, 318 (Leeds and Yorkshire Society); William Glover, 306 (Northern Association); Joseph Smith, 304 (Sheffield Society); Charles King, 298 (Devon and Exeter Society); Samuel Perkins Pick, 289 (Leicester Society).—*Not elected*: William Bell, 283 votes (York Society); Robert Evans, 253 (Nottingham Society); Thomas Martin Cappon, 244 (Dundee Institute).

Representative of the Architectural Association (1).—William Howard Seth-Smith [*unopposed*].

Auditors (2).—Walter Hilton Nash [*F.*]; Herbert Arnold Satchell [*A.*] [*unopposed*].

The Standing Committees.

The Scrutineers, Messrs. Frederic R. Farrow [*F.*], Arthur Ashbridge [*F.*], Alfred W. S. Cross [*F.*], E. Arden Minty [*F.*], Thomas A. Pole [*A.*], H. S. East [*A.*], Herbert A. Satchell [*A.*], Fred. W. Marks [*A.*], who examined the voting papers for the election of the four Standing Committees, declare the results to be as follows:—

ART.

Fellows (10).—*Elected*: Henry Frederick Bodley, 408 votes; Ernest George, 407; Henry Thomas Hare, 343; John McKean Brydon, 331; Alfred Waterhouse, 327; Edward William Mountford, 316; John Macvicar Anderson, 307; Thomas Edward Collcutt, 304; William Douglas Caröe, 294; James Brooks, 290.—*Not elected*: Henry Heathcote Statham, 255 votes; William Young, 245; Charles Harrison Townsend, 215.

Associates (6).—*Elected*: Andrew Noble Prentice, 384 votes; Henry Vaughan Lanchester, 349; James Sivewright Gibson, 334; John William Simpson, 326; William Henry Romaine-Walker, 323; Robert Shekleton Balfour, 314.—*Not elected*: William Arthur Webb, 264 votes.

LITERATURE.

Fellows (10).—*Elected*: Alexander Graham, 407 votes; G. H. Fellowes Prynne, 386; R. Phenè Spiers, 385; William Alfred Pite, 377; John Bilson, 375; Paul Waterhouse, 373; Benjamin Ingelow, 372; Sydney Smirke, 353; Henry Heathcote Statham, 346; Charles Harrison Townsend, 311.—*Not elected*: John Hebb, 292 votes.

Associates (6).—*Elected*: Arthur Smyth Flower, 329 votes; Leslie Waterhouse, 301; Percy Scott Worthington, 301; Professor Elsey Smith, 285; Andrew Noble Prentice, 280; John Humphreys Jones, 246.—*Not elected*: Arthur Maryon Watson, 229 votes; Edward William Hudson, 179; Hubert Christian Corlette, 174; William Adam Forsyth, 163.

PRACTICE.

Fellows (10).—*Elected*: Douglass Mathews, 368 votes; Thomas Joseph Batterbury, 363; Samuel Flint Clarkson, 356; George Hubbard, 338; Walter Hilton Nash, 338; Beresford Pite, 328; Edmund Woodthorpe, 315; James Osborne Smith, 311; Alexander Henry Kersey, 293.—*Not elected*: Arthur Ashbridge, 239 votes; Frederick Ernest Eales, 212; Lewis Solomon, 209; Delissa Joseph, 149.

Associates (6).—*Elected*: Charles Henry Brodie, 335 votes; William H. Atkin-Berry, 311; William Henry White, 311; Augustus William Tanner, 295; Henry Hardwicke Langston, 246; Sydney Perks, 236.—*Not elected*: William Woodward, 218 votes; Robert Stark Wilkinson, 191; Edward Greenop, 174; Herbert Alexander Pelly, 135.

SCIENCE.

Fellows (10).—*Elected*: Percival Gordon Smith, 388 votes; Lewis Angell, 379; Thomas Blashill, 374; William Charles Street, 372; Keith Downes Young, 365; Herbert Duncan Searles-Wood, 362; Frederic Richard Farrow, 333; Alfred Saxon Snell, 325; Benjamin Tabberer, 316; Hampden William Pratt, 314.—*Not elected*: William Edward Riley, 293 votes; Lewis Solomon, 266.

Associates (6).—*Elected*: Matthew Garbutt, 347 votes; Max Clarke, 339; Henry William Burrows, 331; Bernard John Dicksee, 297; George Pearson, 281; Sydney Benjamin Beale, 277.—*Not elected*: James Sivewright Gibson, 253 votes; Robert Watson, 180; Edward Greenop, 174.

The late Charles Barry, *Past President.*

Mr. Gruning made regretful reference from the Chair last Monday to the loss that has befallen

the Institute by the death of Mr. Charles Barry [*F.*], F.S.A., which occurred at Worthing on the 2nd inst., in his seventy-sixth year. Mr. Barry was President of the Institute from 1876 to 1879, a time, Mr. Gruning observed, during which many and important changes took place in the administration of the affairs of the Institute. On his retirement from office in 1879 the grateful acknowledgments of the General Body were tendered him for the able and courteous manner in which he had discharged the specially important duties which fell to him during his term as President. By his untiring zeal, admirable tact, and sound judgment the efficiency of the Institute was materially improved and its influence greatly strengthened.

Mr. Barry was the eldest son of Sir Charles Barry, with whom he served his articles, and to whom he acted as assistant at the time of the rebuilding of the Houses of Parliament. His connection with the Institute began fifty-four years ago, in 1846, when he was elected an Associate. In 1854 he became a Fellow, and in 1877 the Royal Gold Medal was conferred upon him for his executed works as an architect. A notice of his professional career will appear in a future issue of the JOURNAL.

At the funeral, which took place at Broadwater Cemetery, near Worthing, on the 6th inst., the Institute was represented by the President and the Hon. Secretary. On the motion of the latter, the Meeting last Monday passed a resolution of regret, and of condolence with his relatives in the loss they have sustained.

REVIEWS.

WORKING-CLASS DWELLINGS.

Houses for the Working Classes in Urban Districts. Comprising thirty typical and improved plans. By Sydney White Cranfield and Henry Ingle Potter, Associates R.I.B.A. Price 15*s.* [*London: B. T. Batsford, 94, High Holborn.* 1900.]

This handsome volume, produced by two Associates of the Institute, is worth careful study. After giving many suggestions on planning and elevations, which seem for the most part judicious, they put together in a handy form the public regulations applicable to such dwellings and illustrate the subject by many clearly drawn illustrations, well explained. Nine types of houses are given, five of them ranging from the small four-roomed terrace house to the six-roomed house of more complicated plan; and the system of putting at the head of each type the plan in ordinary use, following it with plans showing suggested improvements, is to be commended. The remaining plans show modes of combining two tenements or flats in one house, an idea that probably must be carried out to a very large extent on the margins of towns.

Perhaps the most suggestive feature of the book arises out of the difficulty of providing three bedrooms in houses of narrow frontage. This is very ingeniously met by the device of a broken or dog-legged party wall between each pair, thus widening the front of one house and the back of its fellow, so that alternately two bedrooms can be got in front and two in rear. By adopting the staircases to suit each case the object is gained, in the simpler plans at least, without much cost. There is a good deal of variety in the arrangement of the scullery and offices.

The type of plan in which the gloomy back parlour of the ordinary terrace house is replaced by the kitchen department, while a good lightsome sitting-room forms the back addition, is well represented. No doubt many of these types are beyond the reach of the ordinary working man; indeed even the cheapest of them is too much for the class of workmen for whom the house question is now being raised. None of these can afford a whole house, and so the plans here given of cottages to be let in flats have a special value. Here the dog-legged party wall is used, as it has often been used, to vary the sizes of tenements built in blocks, and many of the combinations are novel and useful.

One is inclined to ask why such books as this are offered to architects? No doubt any unwary ones amongst us copying these plans would come to a bad end, and soon; but, by proceeding warily, by leaving out all the features we dislike, by leaving in all that everybody knows, and, in the last resource, by venturing something of one's own, one may take a hint here and there and escape in safety. On the first of these points I will offer a few suggestions.

An angle fireplace is very suitable for a small bedroom, and, when the living-room is less than ten feet wide, it is very tempting; but it is very awkward in the family circle. The family circle, perhaps, originated when the fire was in the centre of the hall; we content ourselves with a semi-circle; but to squeeze its members into a quadrant, into which the housewife, who has always something going on at the fire, must break her way by tugging at the meekest of her flock may be to disturb the harmony of family life. Better struggle to keep the living-room wide enough to allow of the fireplace being placed, as usual, in the party wall. Winders in staircases must generally be necessary in small houses, and, if put where one may reasonably look out for them, may be free from objection; but in unusual combinations or where only one is used in a place there must be danger. To eke out the size of a small room, or to add to the comfort of a larger room, by a bay window is to gain at the same time a very picturesque effect. But the space so gained is costly, and the bays so freely used in these designs may have to be abandoned, even if some of the rooms

should have to be widened as an alternative. Several of the bedrooms are of very scant dimensions, though such are often used, and with many people it must be a question of small rooms or none.

To go carefully over each plan in this book with the explanatory letterpress, bringing as much outside experience to bear on it as possible, would be an excellent preparation for the design of suburban houses suitable for the working classes, and not for them alone. THOS. BLASHILL.

GARDEN MAKING.

The Art and Craft of Garden Making. By Thomas H. Mawson, Garden Architect. Illustrated with perspective views drawn by Mr. C. E. Mallows and others, and also with numerous Plans, Sections, and Details of Garden and Garden Ornament, and further illustrated with Chapter Headings designed by Mr. D. Chamberlain. Roy. 4o. Lond. 1900. *Price* 21*s. net.* [*B. T. Batsford, 94 High Holborn.*]

Home and Garden. Notes and Thoughts, Practical and Critical, of a Worker in Both. By Gertrude Jekyll. With fifty-three illustrations from photographs by the Author. 8o. Lond. 1900. *Price* 10*s.* 6*d. net.* [*Messrs. Longmans, Green, & Co., 39, Paternoster Row, E.C.*]

Gardens from time immemorial have been the delight of man. Since our loss of Eden it seems to have been an instinct in us to cherish in a humble way the loveliness of the gifts that God has allowed us to retain. The "Garden of Herbs," with the attendant sowing of seed and watering, is several times mentioned in the Old Testament. One feels that Ahab's murder of Naboth has its brighter side in the love for a garden that led him up to the deed. Nowhere has love of this kind been more forcibly expressed than in the Song of Solomon: "A garden enclosed is my sister, my spouse;" "a fountain of gardens, a well of living waters." The hanging gardens of Babylon, the Roman gardens of classic time, the monastic gardens, and later the Italian and Dutch gardens show how universal this love has been. Lord Bacon says that "it is the purest of human pleasures, the greatest refreshment to the spirits of man." No wonder then that even in this overwrought and busy age we still have some of this love left in us. There is evidence of this not only in the increased desire that we see on all sides to cultivate lovely flowers and plants, but also to lay out grounds, to help to show their loveliness to the best advantage. A further evidence is the increased amount of literature referring to the subject, and we are glad to welcome Mr. Mawson's new work, which will be a guide to many and help them to do better in forming their gardens than has of late been done under the guidance of those horrors of all architects the landscape gardeners.

Mr. Mawson, who calls himself a garden architect, for fear he should be confounded with them, seems to have a true feeling of what a garden should be. He recognises the necessity of treating the grounds with appreciation of the dignity and careful design which they should have. The parts near the house should be laid out to act as a framework to it, and add to the harmony of the whole. While allowing meandering walks in the more distant parts he professedly objects to mere "wriggles" in paths, yet some of his plans show that his mind is not entirely emancipated from them. In fact in his preface he confesses this to some extent when he says, "Whilst I consider a formal treatment the one most likely to give satisfactory results I do not think 'the art and craft of garden-making' is advanced by a slavish adherence to style or tradition. In my own practice I am bound to confess I have often executed work which could not be justified by those rules or canons of art which some would apply to garden-designing, and yet to me the effect has been harmonious."

The book is set out in a thoroughly systematic manner, and will always be useful for reference as well as study. The early chapters are on the making of the garden and the choice of the site and its treatment. In the first he goes into history and tells us of "Capability Brown" and the harm that his conceit did; also of Repton's endeavour to correct his work, and the rules he laid down. He then enters into the practical question of treating the ground, the difficulty of deciding such questions as how far to leave and how far to cut down trees, and in another chapter he discusses fences and gates and gives some very good recommendations and some good illustrations too.

The author gives good advice on terraces, and when he speaks of the beds he says that "the more simple the design of the beds the better they look," agreeing with Lord Bacon when he says that "as for the making of knots or figures with divers coloured earths, that they may be under the windows of the house on that side on which the garden stands, they be but toys; you may see as good sights many times in tarts." The chapter on trellis work and garden furniture is full of good suggestions, and the illustrations show how effective very simple designs may be made. The seats, the sundials, and many other accessories are good and very carefully shown. In treating of water he has some charming illustrations of basins with standards in the centre from which the water may pour down; but when he gets to the lakes it would take even Capability Brown all his time to invent more extravagant twists and twirls in the outline than our author has devised for the lake in Wolverhampton Park.

He discourses freely on the planting of trees—both the formal trees set at significant points or in avenues, &c., and those planted for landscape effect—and gives good practical advice as to the varieties to group together and the soil, &c., for them. In a special chapter on conservatories he explains the necessities of different classes and the points on which failure is likely to follow. The kitchen garden is far from beneath his notice. To his mind "no garden pleasure exceeds that of being able to wander round a good walled-in

garden, enjoying the fragrance of the fruit blossoms in the spring, watching the setting of the fruit and its various developments through the successive seasons until the ingathering."

With a man like Mr. Mawson, whose love of a garden is so great, it has been quite a pleasure to wander down the shaded alleys, to rest in the arbours so loved by poets and all who are given to contemplation, and to sit on the quiet retiring seats, not only "for whispering lovers made," but for all who grow warm in their affection for nature set out in her best array by art.

Sedding, speaking of a garden, says: "It is man's report of earth at her best. It is earth emancipated from the commonplace. Earth is man's intimate possession—earth arrayed for beauty's bridal." Such warm words make our affections glow, and make us long that this love may increase in others and may be aroused where it is lying dormant. May our author's work tend to this result.

Cambridge. W. M. Fawcett.

Home and Garden, by Gertrude Jekyll, will be welcomed by all who are about to grapple with that most engrossing problem, the building of a home. Although it appeals only indirectly to the architect the principles laid down for guidance should have a valuable effect on much of our modern domestic architecture were they more often taken into consideration. The careful observance of local tradition in building, involving the design of every detail for its special purpose in the local manner, means the expenditure of much time and thought, for which the manufacturer's pattern book is too often an easy substitute, and the use of the most durable and honest material is at variance with the desire for cheapness or the maximum of effect with the minimum of trouble, so characteristic of the present day.

The chapters on the arrangement and working of the garden are excellent, and the tolerant spirit in which the different styles of gardening are discussed, with a view to the best possible effect, is admirable. The fine effects to be gained by simple combinations and contrasts of well-known and easily reared plants in most unpromising soils (chapter xvi.) should prove exceedingly helpful to those whose gardens are small and unfavourably situated.

As the garden under consideration in this instance is essentially a cottage garden, though of considerable extent, the architectural possibilities of gardening do not come within the scope of the book, but such instances as the illustration on p. 69, Mullein and Lilies and Cannas in The Tank Garden, p. 77, indicate what fine effects can be obtained by the simplest means, and should prove an incentive to further effort in this direction.

Almost any garden is capable of development in this way, and the expenditure of a little thought and care in laying out would often transform the usual dull and meaningless suburban garden into a real pleasure ground full of interest and beauty.

The possibilities of tank gardens and rock gardens in their simplest forms are also great (chapter x.), and these would often repay one's labour much better than the hopeless struggle to raise delicate plants in the arid stony beds that form so many cottage and villa gardens in the suburbs (p. 95).

The system of setting aside spaces for particular flowers, which is usually associated with large plans, is here recommended on quite a small scale, the flowers being carefully selected to suit the soil and aspect as well as with a view to artistic effect. The arrangements of irises, lilies, and roses, &c., described in chapters vii. and viii. would have a fine effect.

There are chapters on miscellaneous subjects which rather interfere with the continuity of the book, and though they possess an interest of their own their inclusion in a separate volume would have been a distinct gain to the present.

The book is illustrated by numerous photographic plates, including several well selected views in the garden and some fine arrangements of cut flowers in vases, &c. J. J. Joass.

STAIRCASES.

A Treatise on Stairbuilding and Handrailing, containing numerous examples illustrating the construction of the Various Classes of Wood Stairs, both for Houses and Passenger Ships, and of Stone Stairs; with a Complete Course of Handrailing, showing easy, accurate, and economical methods of getting out and preparing Wreathed Handrails; also an Appendix consisting of a short course of Plane and Descriptive Geometry bearing on the subject. By Wm. Mowat, M.A., and Alexander Mowat, M.A., Science Masters, School of Science and Art, Barrow-in-Furness. Large 8vo. London. 1900. [Messrs. George Bell & Sons, York Street, Covent Garden, W.C.]

"Nothing marks more clearly than the design of the staircase the difference between an architectural composition and a builder's box." Endorsing Professor Barry's sentiment, we heartily welcome the excellent book before us on stairbuilding. The authors have spared no trouble to make the volume attractive and useful; the illustrations, numbering over 400, are well chosen and clearly drawn, and there is a comprehensive index.

The subject has been arranged in three divisions:—(1) the construction of wood stairs, (2) handrailing, (3) stone stairs—a section devoted to the construction of stairs for passenger ships being a special feature of the first portion. The knotty problem of ships' staircases would probably find the majority of architects quite at sea, if they were called upon to solve them; experience in this respect is necessarily limited, and, as information in this special branch would be difficult to obtain, the book becomes a valuable addition.

For ships and steamers a small space only can be set apart for the stairway; and this fact, together with the necessity of regarding the curvature of the decks and other irregularities of form, makes the setting out of the staircase a matter of special difficulty. Winding flights and complex wreathings must enter largely into the composition of the passenger ship's staircase, making it a happy hunting-ground for the architect or student who delights to solve such problems geometrically. The authors have a thorough grasp of the science of ships' joinery, and, from the architect's view, are perhaps too deeply imbued with this spirit. The division on handrailing—comprising no less than eight chapters—is chiefly devoted to the geometrical setting-out of wreaths, though the complex diagrams are suggestive rather of intricate problems in astronomy. Now, the wreathing and contorting of handrails is, we admit, unavoidable in the design of many ship-staircases; it is frequently required, moreover, in houses and in public buildings. In such cases it is desirable that the application of geometrical principles should prevail over the rule-of-thumb methods so frequently adopted. But the student should always remember that the taste for wreaths and similar contortions in stairbuilding is a vicious one, to be tolerated where such forms are necessary, but not encouraged. "It is common experience"—to quote the authors—"that architects too often show . . . an entire absence of appreciation of the points that conduce to a satisfactory handrail." But how often is not this lack of appreciation betrayed by the unnecessary introduction of curved surfaces! So much consideration is given throughout the book to the study of the curves that there is danger lest the student may receive the impression of their being an important and desirable element in the design. Stairbuilding reached its fullest development about the end of the sixteenth century; and the designs of that period gain in dignity by the entire absence of curves from the handrail and soffits—witness the delightful examples from Crewe Hall, Knole, and Hatfield House, each of which is represented by a full-page illustration.

The chapters on stone stairs are excellent in every respect. LESLIE WATERHOUSE.

NOTES, QUERIES, AND REPLIES.

Mr. Prior's "Gothic Art in England" [p. 375].

From Professor BALDWIN BROWN, M.A. [*H.A.*]—

On p. 378 of the last issue of the JOURNAL, line 15, the words "though necessary" should read "though necessarily concise." On p. 376, line 13, the printer has put a capital "C" to *commacini*. I write it with a small "c" because I incline to the view of the editors in Pertz's *Monumenta* of the document in which the word occurs, that it merely means "associated masons" and has nothing to do with Como. I am glad to see that Dehio and von Bezold take this same view.

Mr. Moore's "Gothic Architecture" [p. 279].

From Mr. CHARLES HERBERT MOORE—

The review by Mr. Francis Bond of my book on Gothic Architecture which has just appeared in the Institute JOURNAL does me injustice, which I beg to be allowed to correct. After speaking courteously of the book, and saying that it sets forth the philosophy of Gothic construction which is scattered throughout the many volumes of Viollet-le-Duc's *Dictionnaire*, he asks, "Can it be that archæologists have learned nothing for thirty years or more? Certainly in France the far-reaching hypotheses of the sixties are no longer received in an unquestioning spirit." If by this it is meant to imply that Viollet-le-Duc's philosophy of Gothic construction is now discredited in France, it is quite wrong. M. Anthyme St. Paul, M. Brutails, and others have questioned some of his conclusions respecting such matters as the influence of the Cluniacs on the architecture of the twelfth century, the chronology of certain classes of buildings, the part taken in the evolution of the Gothic style by the lay builders, &c.; but no one has questioned his general philosophy of Gothic construction.

I have said that the flying buttress exerts a counter-thrust to the vaulting, to which Mr. Bond objects, and says that its function is merely to "transmit thrust." But will he maintain that if the vaulting were removed there would be no action of the flying buttress tending to disturb the equilibrium of the pier? He affirms that my description of a Gothic building is applicable to Amiens cathedral only. But this is incorrect. It applies to every Gothic building, in so far as its original scheme is carried out and remains unaltered. It applies to Chartres, to Meaux, to Reims, and to Beauvais, and others, as well as to Amiens. It applies, with minor exceptions due to the fact that the system was not yet fully matured, to the cathedrals of Paris, Laon, Soissons, and many others. It applies to Bourges, save for the want of a transept, in the lack of which this building, as I remark (p. 171), is exceptional. It applies to Le Mans, though the form of this building is unusual. Mr. Bond's remark that it has no triforium is incorrect. For although the clerestory of the central aisle is brought down so as to take in the usual triforium space, in a manner that I describe on page 253, the inner aisle has a triforium and clerestory. The remark that my definition "excludes the beautiful Sainte Chapelle" &c. is a quibble. It, of course, excludes it from the category of fully developed Gothic buildings, as I have pointed out on page 20; but I explain that such buildings are Gothic as far as they go. I have not said that a Gothic building must always

have aisles, transepts, triforiums, or any other such features. These are enumerated, of course, as characterising a fully developed Gothic edifice; but it is the peculiar structural system alone that I maintain to be primarily essential to Gothic.

Mr. Bond cites the extra ribs in the vault of the crossing of Amiens as a refutation of my statement that true Gothic vaults have no such ribs. But this vault is an alteration, and thus has no bearing on the question. To my statement that in the Gothic system each pier is compound, he replies that the piers of Châlons and Paris are simple cylinders. But this is not so. The piers of both of these buildings are highly compound except upon the ground story. I refer to such piers (pp. 89, 92, 99, 117), and on page 124 I explain how they were developed into the more completely organic form in the perfected Gothic of Amiens, Reims, and other monuments. "On some minor points," Mr. Bond goes on to say, "it is not easy to agree with Mr. Moore. In true Gothic, he tells us, no superfluous features occur (p. 19). But surely every spire is a superfluity," &c. The passage referred to occurs in a footnote which relates to structural features—the particular ones mentioned being vault ribs. To talk about spires in this connection is irrelevant. But, continues the relentless reviewer, "On page 21 we are told that Gothic arose out of the need of vast stone-built churches, such as could not be constructed without aisles. As a matter of fact, a vast stone-built cathedral was constructed without aisles, and vaulted too, as early as 1150; and there are numerous vaulted hall-churches of early date between Angers and the Mediterranean." A specific enumeration of the churches that Mr. Bond has in mind would be more instructive. Can a single vaulted structure without aisles, early or late, having a span equal to that of both nave and aisles of even a moderate-sized Gothic cathedral, be cited?

To my statement that the architectural requirements of the monastic orders were of comparatively narrow range, and that the freest exercise of invention could not be called out under the shadow of the cloister, Mr. Bond affirms that "the exact reverse is the truth," and he cites the churches of Cluny, St. Martin of Tours, Vézelay, and St. Sernin, Toulouse, in support of his position. These are exceptional monastic churches. Cluny was, indeed, as I have said (page 43), the largest church of the Middle Ages—that is to say, it had, including its extensive narthex, the greatest length. The nave, however, of even this largest of all monastic churches, was narrower than that of Paris; while the east end, the most important part of the mediæval church, was insignificant in scale as compared with the vast double-aisled east ends of Paris or Chartres. But such a very exceptional building is not a fair one for comparison. Let us take the next largest one, that of St. Sernin of Toulouse, and see how much support it lends to Mr. Bond's position. The total width over all of St. Sernin is about 33 metres, and the height of its vaulting is 21 metres; while the total width of Paris is about 46 metres, and the height of its vaulting is 33 metres. But even St. Sernin is an exceptionally large monastic church, while there are many Gothic churches as large, and larger than Paris. It was not, however, merely in respect to scale that I spoke, but in respect to constructive invention; and as to this no evidence has been produced to show that I am incorrect. I have admitted (p. 26) that the first steps of Gothic development were taken in the monastic churches, and have spoken of the admirable inventive activity of the monasteries; but I have also affirmed (p. 27), what I believe cannot be successfully disputed, that the "full development of the Gothic system was not to be the work of the monk." We have, however, little exact knowledge of the precise parts taken respectively in architectural works by the monastic and lay workmen, and there may be room for difference of opinion on this point. Mr. Bond is at liberty to reject my view; but he is not justified in speaking as if the truth were beyond question all on his side.

Again, Mr. Bond says, "On page 43 Vézelay is said to be the characteristic type of Burgundian Romanesque. It is just the reverse." But on page 43 nothing of the kind is said. In the passage referred to I speak of the organic Romanesque out of which the Gothic was developed, and I say that the type (*i.e.* the organic type) characteristic of Burgundy is exemplified in the nave of Vézelay. At the top of the same page I recognise the existence of another type characterised by the use of the barrel-vault. But this latter type has no bearing on my subject.

To my remark (page 45) that the Normans seem not to have been logical designers, Mr. Bond replies that "a single glance at the vaults and piers of Durham or Peterborough would have shown him that they are logical in the extreme." If the reader will turn to the page referred to he will find the grounds stated on which my opinion is based. Nothing that can be shown in Durham or Peterborough can alter the facts there stated. "How," Mr. Bond asks, "can St. Germer, which cannot have been commenced before 1140, have suggested transverse arches in the triforium (page 49)? Such arches are found in undoubted eleventh-century work at Chichester, Norwich, and Durham." But on page 49 nothing whatever is said about transverse arches in the triforium. If by "transverse arches in the triforium" (*sic*) the critic means to designate rudimentary flying buttresses (which are what I there speak of), he ought to produce evidence that such were ever built in the eleventh century, either at Chichester,

Norwich, Durham, or anywhere else. The reviewer takes exception to my chronology. But I have stated (page 69, *note*) that I do not profess to establish the dates of early buildings with absolute sureness, that the precise order of them is very uncertain; but that while it is so, an illustration of the general progress of Gothic development may be none the less correctly gathered from them.

I am accused of having drawn my notions of St. Front of Périgueux from an obsolete author, and of ignoring the more recent writings of M. Brutails and others, who are supposed by Mr. Bond to have established different notions. But I do not regard the evidence of these writers as conclusive, either as to the date, or as establishing the autochthonous character which they claim for the building. While to say that it is Byzantine in plan only, shows, I think, a misunderstanding of what chiefly constitutes the Byzantine style. That which differentiates Byzantine architecture from all other architecture is the dome on pendentives as we find it in St. Front. The unessential peculiarities adduced by M. Brutails, such as the pointed form in the supporting arches, the ovoid shapes of the domes, and various details of the masonry, are insignificant in comparison with the larger features of the system, including the plan, which are all Byzantine, and not like anything proper to Western Europe.

"But," Mr. Bond concludes, "the essential weakness of the book lies deeper. It consists in looking at mediæval art solely with the eyes of an engineer. Gothic architecture is not merely engineering; it is art also. . . . I am willing to admit that the Frenchman was the cleverer engineer. . . . It was clever engineering, but bad art, to make the voids outbalance the solids; to attenuate the supports so that the building seems alarmingly unstable; to make the vault rest, or seem to rest, on sheets of glass. . . . And though it may be good engineering it is certainly bad art to build a grand exterior and leave it for all time blocked up from view by a scaffolding of buttresses, flying buttresses, and pinnacles." Mr. Bond is mistaken in supposing that I have looked at mediæval art with the eye of an engineer. I have taken pains to show that Gothic architecture is not engineering, but that it is artistic construction. On page 190 I have said: "Structural and artistic principles find simultaneous expression in every step of the progress of this art. Mechanical invention and æsthetic feeling were never separated in the minds of the French builders. They were true artists, and wrought with a steady regard for beauty. I would again emphasize this, lest from our lengthened examination of its structural growth it should be in any degree inferred that Gothic architecture was such a growth merely. The Gothic monument, though wonderful as a structural organism, is even more wonderful as a work of art." And I protest that it was not bad art, but consummate art, to make the voids exceed the solids in the manner in which the Gothic architect did it. I protest, also, that the supports in true Gothic architecture are never attenuated so as to make the building look in the least unstable. The eye is everywhere assured of perfect stability. The vaults never seem to rest on sheets of glass. They rest visibly on their magnificently proportioned and functionally compound piers. While as for a grand exterior blocked up from view by a scaffolding of buttresses, flying buttresses, and pinnacles, no such thing ever existed in Gothic art. The longitudinal exterior of a Gothic building consists of these members, organically adjusted, and grandly ranged in order, so that the expression of the whole is suggestive of a mighty living organism of transcendent beauty.

MINUTES. XV.

At the Fifteenth General Meeting (Business) of the Session, held Monday, 11th June 1900, at 8 p.m., Mr. Edw. A. Gruning, *Vice-President*, in the Chair, the Minutes of the Meeting held 21st May [p. 380] were taken as read and signed as correct.

The Chairman announced the decease of Charles Barry [*F.*, F.S.A., *President* 1876–79, *Royal Gold Medallist* 1877, and having briefly referred to the services rendered the Institute by Mr. Barry during his occupancy of the Presidential Chair, on the motion of the Hon. Secretary a resolution was passed expressing the Institute's regret for his loss, and of sympathy and condolence with his family in their bereavement.

The Hon. Secretary announced the decease of Edward Joseph Hansom, of Newcastle-on-Tyne, *Fellow*, and of the Comte de Marsy, Director of the French Society of Archæology, *Hon. Corresponding Member* (Compiègne), and it was resolved that the Institute's regret at the loss sustained by their decease should be recorded on the Minutes of the Meeting.

The Secretary read the Reports of the scrutineers of the voting-papers for the election of the Council and Standing Committees for the year of office 1900–1 [p. 398].

The following candidates for membership were elected by show of hands under By-law 9:—

As Fellows (9).

IBRAHIM SHAIK DAÚD AHMADI [*A.* 1888], L.C.E. (Bombay), Fellow of Bombay University, Executive Engineer P.W.D. Bombay.
JOHN BAIN [*A.* 1892], Newport, Mon.
SYDNEY FRANCIS BARTLEET.
HENRY BUDGEN [*A.* 1892], Cardiff.
ALFRED ARTHUR COX [*A.* 1885], *Grissell Medallist* 1886, *Godwin Bursar* 1890, Montreal.
THOMAS DINWIDDY.
ERNEST FLINT [*A.* 1880].
FRANK LOUGHBOROUGH PEARSON.
NATHAN GLOSSOP PENNINGTON.

As Hon. Associates (2).

GEORGE JAMES FRAMPTON, A.R.A.
FRANK NEWTON JACKSON.

The proceedings then closed, and the Meeting separated at 8.30 p.m.